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Homans, Sheppard

Report of
Sheppard Homans...

New York

1861

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Mutual Life Insurance Co. of N. Y.

HE MUTUAL LIFE INSURANCE CO. of NEW-YORK,

94 Broadway, New-York, May 24, 1861.

To the Committee on Insurance:

Gentlemen—I have the honor to report the result of my visit to the Assurance Companies of Great Britain, undertaken in obedience to your instructions.

I called on Mr. Samuel Brown, at his office, soon after arriving in London, and laid before him a copy of the various statements and queries proposed under your direction, with a request that he would reply to the same in a letter, to be addressed to the President and Board of Trustees of this Company. As soon as I saw the rough draft of this reply, I started from London for Edinburgh, in order to consult Mr. Wm. Thos. Thomson, President of the Faculty of Actuaries of Scotland, and Manager and Actuary of two of the prominent Life Companies in that city, and who, I understood, was the best authority on Assurance matters in Edinburgh. Unfortunately, Mr. Thomson was absent when I arrived, and in consequence I was detained eleven days longer than I anticipated. As soon as he returned I had an interview with him, and submitted to him a copy of the same statement and queries, with a request that he would reply to the same at his earliest convenience. When Mr. Thomson's reply was received, I engaged passage on the first steamer leaving for New-York, where I arrived safely on the 21st of the present month.

I have now the pleasure of handing you the official replies of Messrs. Brown and Thomson, together with a copy of the statement and queries as submitted to them by me, printed copies of which have already been sent you.

The selection of Mr. Brown, as a professional adviser to the Company, was most judicious. His scientific attainments and practical experience are very extended, and no one stands higher in Europe as a skilful Actuary. He has devoted much time to the subjects entrusted to his care, and has studied faithfully the various points set before him, so that the suggestions and recommendations contained in his Report are well worthy the most attentive consideration. Mr.

Thomson is well known as the Manager and Actuary of the
the largest and most successful companies in Europe. He ha
both as a man of business and as an experienced Actuary, a
on all Assurance matters is entitled to great weight. On th
two gentlemen could have been selected more competent to give a
on the questions set before them.

I received every possible courtesy from these gentlemen, and much pleas
attention. Furnished with introductions by Mr. Brown, I visited almost eve
prominent life company in London and Edinburgh, and studied carefully bot
their theory and practice. In all cases, I stated frankly that my object was to
obtain information as to the working of life assurance institutions in Great Britain,
and in return would be happy to reciprocate by giving the results of experience
in America. My inquiries were invariably met with the utmost courtesy, and
much valuable information given, which I am quite sure, in some cases, would
have been withheld from their own associates. Considerable interest was mani-
fested in assurance matters in this country, particularly in regard to the laws and
reports of the States of Massachusetts and New-York. I am under especial obli-
gations to the following named gentlemen:

Messrs. JELLICOE & LAUNDAY,	of the	Eagle Assurance Co.
HENDRICKS & NEWMARCH,	"	Globe.
MORGAN & STEVENSON,	"	Equitable.
GODDARD,	"	Rock.
DOWNS,	"	Economic.
HODGE,	"	General Reversionary.
TUCKER,	"	Pelican.
WALFORD,	"	Unity.
RATRAY,	"	Victoria.
LODGE,	"	Lloyds'.
SCRATCHLEY,	"	Western.
WATSON & MEIKLE,	"	Scottish Provident.
THOMSON & DR. CHRISTISON,	"	Standard.
FINLAY,	"	Edinburgh.
CHRISTIE,	"	Scottish Equitable.
RALEIGH & ANDERSON,	"	Scottish Widow's Fund.
SMITH & CHISHOLM,	"	North British.
RAMSAY & BAILUS,	"	Scottish Union.
Professor SANG,		
DOVE,	"	Royal.

I was fortunate in having an opportunity of discussing with each of these gentlemen the various questions of interest in life assurance, and to gather their views upon many important points of practice. This experience, to me, will be most valuable, and will give me more confidence while discharging my duties in this office. I have taken pains to collect many valuable reports and pamphlets relating to the several companies.

As a result, I am proud to state that there is no single assurance institution in Great Britain which, all things considered, occupies a more enviable position than the "MUTUAL LIFE"—no one exhibiting a success so rapid, and yet so healthy—no one in a position where the improvements suggested by science and experience may be so readily applied in practice: and, in fact, as generally acknowledged, no life company in the world where so brilliant a future is promised by the realities of the past and present.

At the same time I feel satisfied that in some few respects we may follow to advantage the example of the better institutions of Great Britain: Forfeitures and Surrenders in this company might be thus made fewer. The propriety of some proposed changes in the books of this office has been made more apparent, although as a whole the internal management of this company will bear comparison with any on the other side of the Atlantic.

My expenses have been	$950.00
Fee to Samuel Brown, Esq.	500.00
" Will. Thos. Thomson, Esq.	250.00
Commission and exchange, (Duncan, Sherman & Co.)	25.60
Total expenses	$1,725.60

I am, gentlemen, very faithfully yours,

SHEPPARD HOMANS,
ACTUARY.

The following Statements and Queries, prepared in accordance with a resolution of the Insurance Committee of February 9th, 1861, were submitted by the Actuary to Mr. SAMUEL BROWN, Vice President of the Institute of Actuaries of Great Britain, and Actuary of the Guardian Assurance Society of London; and to Mr. WILLIAM THOS. THOMSON, President of the Faculty of Actuaries of Scotland, and Manager of the Standard, and also of the Colonial Assurance Societies of Edinburgh; together with the respective Reports of these gentlemen in answer to these Queries, are now printed for the *private use* of the Trustees, in obedience to a Resolution of the Insurance Committee adopted May 23d, 1861:

SURVIVORSHIP ANNUITIES.

"The Officers of the Mutual Life Insurance Company of New-York have now under consideration the expediency of offering to the public rates of premium by which Survivorship Annuities or Assurances, at any combination of ages may be secured. It is believed that such benefits will enable the insurer to designate a definite and certain provision for the permanent support of a surviving *nominee*, secure alike from the danger and expense necessarily involved in the investing of money by inexperienced persons, and from dependence upon advisers who may perhaps prove injudicious or adversely interested. Instances are not wanting in the history of this Company, where the proceeds of a life policy, intended for the support of a widow or orphans, the fruit perhaps of toil and sacrifice for years, have been wholly or partially lost by an injudicious investment—thus defeating the very object for which the benefit was purchased."

Query 1.—*Are Survivorship Annuities, as a class, desirable to a Life Company—if not, why?*

The Table of Mortality now used by the "Mutual Life," constructed by their former Actuary, the late Professor C. Gill, does not represent accurately the rate of mortality among the policy holders. The "Carlisle" is also unsatisfactory and defective in the application now proposed. The statistics of all American companies as well as independent reasoning, would seem to indicate that the value of life among assured lives in the Northern United States is greater at the middle ages, say from ages thirty to sixty, while less at younger and older than obtains among a similar class in England. After a careful study of the subject, the Actuary (Mr. Homans) has constructed a new table of mortality, which, judging from past indications, and having due regard to the value of selection is believed to be a fair exponent of the rate of mortality which may in future be anticipated among the members of the "Mutual Life." This new table is offered, not for the purpose of changing existing rates of premium or present business in any way, but as a more satisfactory basis for the construction of rates of premium, &c. for Survivorship Annuities, and more especially as a means of making a more equitable division of surplus in any dividend. The peculiarities of this new table may be seen by reference to the accompanying tables and diagrams, and more clearly, perhaps, by the personal explanations of Mr. Homans.

Query 2.—*If Survivorship Annuities, as a class, are desirable, is the new Table of Mortality, constructed by Mr. Homans, a safe and judicious basis from which to deduce such rates of premium, properly loaded for the Mutual Life Insurance Co. of New-York? If not, why?*

The surplus of the "Mutual Life" is ascertained and appropriated among the policy holders, *quinquennially*, in accordance with the charter of the Company which provides that the officers at stated times, "shall cause a balance to be struck of the affairs of the Company, and shall credit each member with an *equitable share* of the profits of the said company. [See Charter and By-Laws.] Instead of paying this *equitable share* in cash, an *equivalent*, payable at death or on maturity of the policy, is added to the amount assured.

The scales adopted for the dividends of 1853 and 1858, by the former Actuary, Mr. Gill, by which these equivalents or reversionary values were determined, in the absence of complete and reliable data, were very judiciously *made safe* for the Company. Mr. Gill also endeavored, by means of these scales, to compensate for the injustice in the rates of premium charged at older ages, arising from the unequal loadings, for expenses (10 per cent. at all ages), which he explains in the following language: "It was at first intended to use the value of A_x (single premium, or paid up policy, see column 3, table iv,) for this purpose but for the following reason: "In strict justice the premiums ought to be so loaded, that while a proper percentage should be added at each age to cover the possible inequality in the mortality from the tables, yet that part of the loading intended to cover the *expenses of the business* should be *equal at all ages*. It was found, however, that such a method would make the premiums so unlike those that have prevailed in the United States, that they would be apt to startle the community. The values of A_x (column 4, table iv, used in the dividend of 1853,) in this table are intended to compensate in some measure the injustice to the older members."

Afterwards, [1854,] Mr. Gill remarks:

"On a reconsideration of the subject, although the reasoning given under the caption is correct, it seems to be carried too far. Thus by that scheme a party of the age of *twenty* taking a policy on the 1st of February, 1848, would have a reversionary bonus on the 1st of February, 1853, of 7.06 per cent. of amount assured, while one of the age of *sixty* under the same circumstances would have the policy increased by 17.07 per cent. of its amount, and although this may be nearer justice than the practice of the old English companies in dividing their surplus in proportion to the amount assured, I cannot help thinking that the right lies between the two, and after mature deliberation the system in this table has been adopted for future dividends." [These values, see column 5, table iv, were used in the distribution of surplus in 1858.]

In the above reasoning in regard to a compensation for the injustice at older ages, arising from the fact that the loading for expenses proper are *percentages* on the net annual premiums, two important points have been overlooked, viz: 1st—That the *commissions* paid (the principal item of expense) *being percentages*, are greater at older than at younger ages, and hence *require no compensation*, and 2d—That rates of premium based on a lower rate of interest than that actually received from investments (as is always the case in practice), weighs more heavily on younger than on older ages (since the disparity will continue for a greater number of years), and sufficiently so in the "Mutual Life" to neutralize entirely the contrary injustice from the unequal payments for expenses. (See Computation.)

While on the one hand the paramount consideration of providing an ample *reserve* for all liabilities present and contingent should be steadily

kept in view, yet on the other it seems only just that present members, and especially those who joined the Company when its success was uncertain, and to whose contributions and support its present high position is largely due, should derive a proper benefit from and participation in the surplus, or in other words, that the "equivalent" addition to policies should be a just representation of the "equitable shares" (present values) credited to each member in obedience to the Charter.

Recent contributions to vital statistics would seem to demonstrate that the Company's Table of Mortality (Mr. Gill's) as a basis for business is *abundantly safe*, although not perhaps a very fair indication of the relative mortality at different ages. Hence the "additions" or reversionary values computed from the table *with such a large margin* have been less at all ages, and particularly so at the younger, than the actual present values or equitable shares of surplus would have purchased.

If no compensation is made for this injustice, future members will derive benefit from surplus funds, created solely by earlier policy-holders, and belonging to them exclusively.

It is proposed to construct, according to the new table of Mr. Homans, at 4 per cent., a scale of reversionary values, to be used in the approaching distribution of surplus in 1863.

The formula proposed is $R=\frac{P+d}{P}$

Where R = Reversionary value of $1 (or £1) at death.
P = $\frac{115}{100}$ P or net annual Premium loaded 15 per cent.
d = discount on $1 (or £1) for one year 4 per cent.

* The demonstration is this:—The single premium (s) to assure $1 (or £1) at death should be such that the interest thereon for one year would just pay the annual premium at office rates, and its interest for one year on (1—s), thus leaving the (s) intact until death.

$\therefore Sr = p\ (1-s)\ (1+r)$ $\quad \therefore S\frac{r}{1+r} = Sd = p\ (1-s)$

$\therefore S\ (p+d) = p$

$\therefore S = \frac{p}{p+d}$

$\therefore \frac{1}{s} = R = \frac{p+d}{p}$

Query 3.—*Is the new table constructed by Mr. Homans a safe and judicious basis from which to deduce the reversionary values to be used as additions to policies in the approaching distribution of surplus? If not, why?*

Query 4.—*If yes, is it advisable, in your opinion, to make the proposed modification in the scales of reversionary additions retrospective in its application to existing policies?*

5.—*Is the mathematical formula* $\left(R = \frac{P+d}{P}\right)$ *proposed by Mr. Homans safe and judicious in its proposed application?*

Within the past six years many Endowment Assurance policies have been issued by the "Mutual Life." The nature of this risk is peculiar, being *compound:* and the loading is different from that added to the premiums on ordinary life policies. The temporary assurance portion is loaded as usual, 25 per cent. The endowment proper, upon which there is not the same degree of risks, is loaded 10 per cent. only, for expenses. It seems necessary to make a separate investigation and distribution of surplus on this class of policies, since the surplus arising

from the same amount of premiums, for instance, may differ materially from that obtaining on ordinary life policies.

Query 6.—*Should the dividends on Endowment Assurance policies be ascertained and declared separately from that on ordinary life policies?*

The system adopted by the "Mutual Life" for the distribution of surplus is that known as the reversionary, by which, when properly carried out, the largest possible sum is paid at death, in consideration of a certain invariable annual premium.

Applications are frequently made, however, for the privilege of applying individual portions of surplus to lighten the annual payments of premium. This is especially the case in times of monetary pressure, to which business men are more or less liable. In such times, the forfeiture or surrender of the policy is often the result.

The officers of the "Mutual Life" are anxious to afford to the policy holders the greatest facilities, consistent with a due regard for the safety of the whole Company, for keeping alive the insurance until its anticipated or intended maturity, so that the main objects for which the payments of premiums are made may be the better obtained, and the party for whom the benefit was intended reap the full advantage of every dollar invested.

There are, however, in a Company where the distribution of surplus is made quinquennially, some serious objections to a cash payment in one large sum, since such a payment, generally larger than the annual premium for the current year, would extend over one year only, leaving the premiums for four years unrelieved. A quinquennial reduction, however, in such a Company, would be free from this objection, and would, theoretically, be assuring a given sum at death at the very least annual cost.

Query 7.—*In case a modification of the present or reversionary system of dividends should be thought advisable, would a* QUINQUENNIAL *reduction of premium (exhausting the surplus in the five years next succeeding the declaration) be judicious and safe in its application to the Mutual Life Insurance Company of New-York? If not, why?*

Query 8.—*Should a Company annually pay any value on surrender of a policy on which not more than three annual premiums have been paid?*

Query 9.—*If any corrections or alterations are necessary or expedient in the Tables mentioned in Queries* 2 *and* 3, *please to state what those corrections or alterations are, and why they are necessary or expedient.*

Query 10.— *What comparative results may be expected among the present members of the "Mutual Life" from the past favorable mortality experience?*

Query 11.— *What suggestions can be made relative to the principles and practice of the "Mutual Life" which would tend to its security or to the advantage of the policy holders?*

REPORT OF SAMUEL BROWN, ESQ.

"*To the President and Board of Trustees of the*
Mutual Life Insurance Company of New-York:

"GENTLEMEN:

"I cannot but feel exceedingly gratified by the honor you have done me in requesting my opinion on the important questions proposed to your consideration by your able Actuary, Mr. Sheppard Homans. I have long watched with great interest the rapid progress which Life Assurance has made in your country, and have been especially astonished at the

growth of your own Company, the most remarkable instance that has ever been recorded of success based not upon mere showy attractions to allure the public, but upon the solid foundation of prudence, moderation and judicious management. In this country even these qualities must wait long, though the great competition they meet, in realising successful results and we have no single instance of a rise so rapid, yet exhibiting a prosperity so sound and permanent. But the causes which have contributed to these effects require careful watching and analysing.

"Both the high rate of interest and the low rate of mortality observed hitherto may be exceptional. The former may diminish as the accumulation of capital in the American States may, through its great abundance, lower the annual interest to be derived from investments, and the latter may increase in the Company as the effect of selection wears off by time and the advancing age of the members. In the observations, therefore, which I may have to make on the points submitted to me, I trust to evince the same cautious regard for the future which has hitherto so greatly contributed to the present high position of the Company.

"1st. *Survivorship Annuities and Assurances.*— There can be no reason why, with premiums properly loaded, this branch of the business of Life Assurance should not be successfully cultivated.

"Most of our companies print tables of premiums for Survivorship Assurance, although the Annuity business is not so common. The contingency to be guarded against, however, is at least double that of ordinary Life Assurance, for whereas the medical examination may save the Company from the risk of unhealthy lives, it is generally found that the self-selection which marks the purchase of Life Annuities, results in Annuitants enjoying together a much longer duration of life than ordinary.

The report on the observations of mortality amongst Government Life Annuitants, by the Government Actuary here, has been published, and though it slightly corrects, or shows a smaller degree of mortality than that published in 1829, yet the difference is very little, and it still proves that Female Annuitants possess a longevity much above that of the ordinary female population of Great Britain.

"The same results have been found in the experience of all our Assurance Companies. The remedy which we have in the case of Life Assurances does not apply in the case of Life Annuities, because, whilst by the aid of our medical officers we may reject unhealthy lives, we cannot, in the reverse case, reject the most healthy and long lived, so as to reduce the experience of a Life Annuitant Company to the ordinary mortality of corresponding ages. But I see no reason on this account for declining this class of business, provided that great care be taken in the selection of the life to be assured, and assuming in the table that the life assured against is better than the average. This does not necessitate the use of of two separate tables, but merely that the premiums should be sufficiently loaded to meet the double contingency alluded to. With this condition there can be doubt that this class of business would be a great boon to a large portion of the public. The provident head of a family may feel secure that by it there is a provision made for his wife and children after his decease not liable to the dangers of doubtful investments, ignorance or inexperience, or the tricks of designing men, but secured upon the capital and good faith of a large and flourishing company, paid with punctuality, and safe from commercial risks.

"2d. *The Table to be used in Calculating Premiums for Survivorship Annuities.*—I agree with Mr. Homans in thinking that the Carlisle Table

should not be taken as the basis for granting Survivorships. It is very largely in use in this country, because it was found to accord much nearer with the actual experience of the best selected lives, whether in Assurance or Annuity Companies, than the Northampton Table, which was before used, mainly as affording a large margin of safety in the premiums calculated therefrom. It was afterwards considered more scientific to take a true table, or one that nearly expressed the real rate of mortality, and load the premiums in some definite proportions. The consequence is that a great multitude of tables have been calculated from the Carlisle, at different rates of interest, for all the questions of Assurances and Annuities, and the facilities thus afforded retain it still in most extensive use. But it is badly graduated at all ages, and will consequently be found to lead often to very anomalous results when exhibited in Tables of Survivorship Annuities.

"The experience of your own and that of other American Companies, though extending over but a short period, may yet, with proper regard to the future, allow of the formation of a set of tables sufficiently accurate for the purpose. But I must draw attention to an important feature in the Company's experience. On comparing Professor Gill's original table, formed for the Company, from the experience of the first ten years to February, 1853, as shown in his second Report, with Mr. S. Homans' Report for the first fifteen years, it will be seen that whereas in both tables the mortality under age 25 is considerably above the Carlisle, from 25 to 35 it is very nearly the same; from 35 to 55 it is considerably less, and after that age again rises above the Carlisle rate. The experience of the whole Company for each of these periods is from 88 to 90 per cent. of that represented by the Carlisle Table; but as the experience of the whole Company comprises that of unsettled and unhealthy regions, it is of importance to remark that

the same variations are observed in Class I alone, though not to so great an extent. Whether this diminution of mortality, extending over a large portion of the middle period of life, is due to permanent causes, or arises from some temporary changes only, perhaps the census recently taken may help to explain. But it is an important point for consideration, because it shows a great degree of vitality at a period during which it may reasonably be supposed the greater part of the premiums for the joint existence of the two lives will be payable, and an increased rate of mortality in the latter period of life when the Survivorship Annuities would become payable. Professor Gill noticed that after 55 a greater increase in the mortality was shown by the Company's experience than by the European Tables, but by Mr. Homans recent tables this rate of mortality appears to have greatly diminished. Whilst this fact is in favor of a Life Assurance Company, it would act against the Annuity branch if the same remark extended to female lives, of whom, I suppose, the annuitants will principally consist. But Mr. Homans' table appears to me, by its adjustment, to meet this objection, and provides at advanced ages for at least the number of Annuitants to be expected by the Carlisle, and between 60 and 80, the period most important for Annuity observations, for considerably more, *so that I can have no hesitation in recommending for Survivorship Annuities his New Table.* I need not add any word of caution as to the watching the effect of it in the operations of the Company, as his Report, which I have had the pleasure of perusing, show not only the ability but the prudence and care with which he analyses and applies the experience of the Company.

"Of the amount of the loading on the premiums I do not think it necessary to give an opinion, as it must depend mainly on the expediency of obtaining and returning large profits, or on the members being contented

with lower premiums and a smaller rate of profits. In this respect the Board of Trustees will no doubt be guided by the other branches of the Company's business, so as to assimilate the results; but as a matter of experience I would suggest that it would be unwise to increase the Annuities by way of profit, because the mortality at advanced ages is at present the most untried portion of the Company's experience. It would be better to apply them, if given at all, to reduce the annual premiums during the joint lives.

"3d. *Divisions of Profit.*—I have no doubt that in allotting an equitable share of the profits of the Company to the surviving members at each periodical investigation, and then appropriating this equitable share to the purchase of a reversionary bonus added to the sum Assured, it was intended to give as nearly as possible the full equivalent value. The table by which Mr. Gill recommended the equivalent to be valued, led to there being an ample reserve in favor of the Company, but in the same proportion it deprived the early members of a portion of their profits for the benefit of those who enter at a later date.

"The risk and responsibility of establishing the Company must however have fallen most heavily upon those who were its first supporters, and to whom it would consequently appear reasonable should be apportioned the full share of the profits to which they have contributed so largely. Assuming that the cash surplus at the time of distribution of a bonus, is bona fide, ascertained with due regard to any risks which may turn against the Company hereafter, that in fact it is a clear surplus, independent of future events, and if the mode of distribution allotted to each member his just share, then the value of such share could be paid to him in cash. But it may be, and in my opinion, would be inexpedient and against the interests of the

Company to alienate so large a portion of the investments. The next best step is to give such a reversionary value as, with a moderate margin to cover fluctuations, and estimated at a safe rate of interest, would as nearly as possible be realized accoring to the actual mortality of the Company. Thus in every way justice would be done to the Assured, the stability of the Company maintained, and any advantage to be acquired by the power which its large capital and the skill of its officers afford, for obtaining the most profitable investments, would, at each succeeding investigation, accrue to the Policy.

"I have examined with great care Mr. Homans' new table and the comparisons of it with that used by Mr. Gill in 1853 and 1858. The table for 1858 gives a slightly increased reversionary bonus at ages under 30, and a diminution of about 4 per cent. at the older ages, as compared with that used for 1853, but the effect of Mr. Homans' new table is to give a rate of reversionary bonus for all ages under 60, considerably exceeding either of those tables, the difference being greater as the life assured is younger. Yet when we examine the premiums actually charged by the office, loaded upon a 4 per cent. table, with the premiums from the same table computed at 6 per cent., the rate actually realized from the commencement of the Company, we shall find in like manner that the rate charged increases from 32.7 per cent., at age 60, to as high as 52.2 per cent. in excess at age 20.

"It would therefore seem but just that the principle to be applied in the allotment of the value of the bonus should have a compensating effect, and the corrected table proposed by Mr. Homans will, in my opinion act in this direction much better than either of the tables used in 1853 and 1858. The values being computed at 4 per cent. interest may, under any circum-

stances, be considered as cautiously safe, and the margin of 15 per cent. not intended so much for the purpose of extracting further profits from those already allotted, as to allow for possible fluctuations in the future, which, looking at the length of time which must elapse before some of the claims fall in, prudence and foresight alike justify.

"4th. *As to Making the Adoption of the New Table Retrospective in its Action on former Bonuses.*—The question is a wide one, because if the bonuses to be allotted by the New Table differ so much from those already granted, and in fact add considerably to the reversionary values at younger ages, it may be asked, why should not the additions to claims, which have already fallen in, be in like manner considered entitled to a share proportionate to that which policies of the same age, and nearly the same standing, will gain by the alteration? To this it may be replied, that to do so would be to open up a revision of the whole of the preceding investigations, and to re-allot the profits in a different manner from what was then effected by the existing laws and regulations. This is manifestly impossible. Yet there can be no reason why, for the benefit of existing and future members, such improvements should not be effected as from time to time may carry out with greater effect the aims and objects of the Company, or cause more perfect justice to be done between the members.

"The alteration proposed would not therefore take effect until the next valuation showed the exact position of the Company, and the bonuses already alloted being revalued according to their ages of the lives Assured, the working of the proposed changes, though apparently retrospective, would in fact depend upon the future progress of the Company. By the system of bonus now prevailing, a considerable amount of profits may be expected to arise out of profits already allotted, whereby the early members,

who have borne the burden and heat of the day, would in fact be receiving less, in order to benefit those who may enter when the risks of its establishment are all passed away, and when its high position is well secured.

"Another thing to be remarked is that the cash value of the bonus, or the equitable share of the profits, would be to each member the same as under the present system. It is only his reversionary bonus that would be increased so as more nearly to accord with the actual mortality to which it is considered probable he would be subject. I conclude that on the whole it will be desirable, not to have two classes of dividends, but in the case of all members existing at the time of the next valuation to so far make the action of the new regulation retrospective, as to give for the then cash value of the existing bonuses the same proportion of the reversionary bonus as his equitable share of the profits to be then ascertained will yield him. In other words, that the whole of the bonuses on the policies existing in 1863 shall be allotted under the new table.

"5th. *Is the mathematical formula proposed by Mr. Homans safe and judicious?*—I consider it to be so. It is equivalent to assuming a new table of single premiums deduced from the annual premiums loaded 15 per cent. on his original table, and is similar to a plan frequently adopted in this country to avoid the anomalies which appear at the older ages by loading the single premiums on an even per centage at all ages throughout life. In the last year of life, for instance when the death is certain in the year, such a system would show the present value of £100 for one year, loaded 15 per cent., or $96.154 \times 1.15 = £110.337$, is only worth £100 at the end of the year of death. Mr. Homans formula, by converting his new Bonus Table into the form of a new mortality table, at 4 per cent. interest, gets rid of these discrepancies, and gives a very simple and practical formula for his calculations of the reversionary bonus.

6. Endowment Assurances.—*Should the Dividend on Endowment Assurance Policies be ascertained and declared separately from that on ordinary Life Policies?*

This is a Class of Assurances of a Compound character consisting (1) of a temporary assurance, the annual premium for which is loaded in the usual way 25 per cent.; and (2) the Endowment proper, loaded only with 10 per cent. for expenses. It is probable, and is generally found to be the experience of Companies, that where an endowment proper is granted by itself, the mortality is seldom greater and is generally less than the rate assumed. Yet, unless the deferred period is very long, it could scarcely be possible to load the Table so as to counteract to any great extent the effect of self selection. As a rule, this latter class of business in this country is not considered to be profitable, because the rate of interest which is comparatively low is the principal, if not the only source of profit. But in America, where the rate of interest rules so high, it is possible that a much larger profit may be obtained. On the other hand the rate of mortality at advanced ages yet remains to be more accurately ascertained, and especially whether the power of self-selection can be exercised to any great extent against the office. If the endowments proper formed a separate class, I should therefore feel disposed to recommend that the policies should all be, for the present at least, issued on non-profit system. But it is manifest that where an endowment is combined with a temporary assurance, whatever tends in favor of the assured in the former would be in favor of the Company in the latter. Whence the combination of the two affords a certain though varying profit for the Company, for if the assured die during the temporary assurance, the Company has had the premium for the endowment extra, and if the assured survives to obtain the endowment, then the Company has gained largely by the premiums, for the temporary assurance. But reviewing the whole case, I should feel disposed to treat the deferred portion of the assurance as not loaded for profits, and to value only the premium for the temporary assurance as bearing a similar rate of profits as ordinary assurances in which the premiums are loaded with the like percentage. A special Bonus Table would, however, require to be prepared for this class of policies, because the equitable share when allotted would have to be converted into an equivalent sum payable either with the deferred sum, or in case of death during the remainder of the term."

7. Mode of Distributing Surplus.—*Would it be safe or judicious to allow the profits to be taken by a quinquennial reduction of the premiums in the five years immediately following the declaration of a Bonus?*

"Assuming that the progress and position of a Company, and its probable career in the future, can be pretty well ascertained, so that all due provision can be made for

any fluctuations likely to arise, I see no objection to giving the option of taking the Reversionary Bonus, either by a cash payment or by reduction of the Premiums for life, or for any other term that may be agreed upon. But, looking to the various elements of change that may effect American Life Companies, it is highly important to be on the side of safety and caution, and to retain as far as possible control over the Funds accumulating from the premiums. By these means not only will the stability of the Company, and its consequent popularity, increase, but the profits obtained for the Members be much more permanent and secure, and more likely to benefit their families than if allowed to be readily withdrawn for any temporary pressure, or promising speculation. I believe the Company has hitherto exercised a wise caution in not encouraging the withdrawal of the full Bonus in cash, and for the present, at least, I should strongly advise merely a modification of the option proposed. The payment of the whole Bonus by a single payment in cash might at some future time be considered, but the effect of it at present would be materially to affect the profits of the Company, considering how large a portion of their profits arise from the interest on Investments. In theory, there is no objection to an equivalent reduction of the premiums for the following five years, thus taking the whole cash value of the Bonus, by the time that the new investigation would allot a fresh Bonus. But, practically, I find that in the long run the reduction spread over the whole duration of life is the most satisfactory and popular. In all Companies it is found that the larger profits on a Policy are made during the early period of Membership, and that the annual profits on a given Policy diminish as the assured advances in age.

The consequence is, that notwithstanding the value of the Life Annuity for the term diminishes at each quinquennial period, whereby, with the same Cash Value to divide, a larger Reduction of premium could be given; yet, as the profits themselves may diminish, the reduction of premium may be less in some quinquennial periods than in others. The discontent caused by such an event is very difficult to remove. I know by experience the annoyance which it causes, and the long and unsatisfactory correspondence to which it leads, though the explanation is simple enough to any member who is willing to receive it. The system of quinquennial reduction was tried for two periods in the Guardian Assurance Office, but I have been obliged to recommend to the Board to return to the old system of allowing only the reduction of premium for Life. Although the amount of reduction is smaller at first, yet as each succeeding Bonus allows of a still further reduction, the assured grows more satisfied at each successive periodical Investigation.

If a good life, he may see the whole of his premium cancelled, and the sum assured remain as an investment secured to his family without any charge to himself.

Without wishing to give a dogmatical opinion on a subject, which may be regarded in a different light by the assured members in an American Company, I

think the observations I have ventured to make belong to human nature generally, and I give them as the result of experience in two different Companies, in which both systems have been tried."

8. *Should a Company pay any Surrender Value for a Policy on which not more than three annual premiums have been paid?*

"The risk of death in the first year after selection of a life, is very small indeed at any age, and it may generally be considered that, including the risk, the greater part, if not the whole, proportion of the business expenses which would attach to any one policy during its continuance in force, might be defrayed out of the first year's premium. At least, such would be the case in a well established company in England, and though it is possible there may be some extra costs, in carrying on the business through the widely extended States of America, yet it is probable that, in a Company well organized, and in progress, it would scarcely, if at all, exceed this cost.

I believe then, that, if it should be deemed necessary and expedient, a surrender value could be given after the second premium has been paid. It is usual in this country to allow for Surrender Values sixty or seventy per cent. of what would be the Reserved Value, computed according to the method at the time of the general investigation, but not to take into account any of the prospective bonuses which the assured may have a chance of surviving to, though some value is generally allowed for them, when a Policy is sold in the open market. The expediency of allowing so early a Surrender Value, must be a question for the Trustees, as no doubt a considerable portion of profit may be made out of Policies effected for life, but dropped within the first three years after being effected. This is very plainly shown in the last Report of the Insurance Commissioner of the Commonwealth of Massachusetts, 1,392, out of 2,180 total Policies forfeited in thirteen Companies, having been dropped, on which no more than three premiums had been paid.

9. *As to corrections or alterations in the Tables named in the second and third questions—*

I have carefully examined Mr. Homans' Tables. They contain, when compared with the English experience, some peculiarities, especially the low rate of mortality at the middle ages, and the higher rate at the younger and older ages, which it will be very interesting and important carefully to watch for the future. The same observations, however, may be seen in the previous Reports of Professor Gill, both first and second, as well as in the public returns of the American Census. There are, therefore, no doubt, good grounds for believing that a wide difference exists at

certain ages in the Mortality when compared with that in the English population. But whether this is due to permanent causes, or whether in the extraordinary rapidity with which the population of the American States has increased, some curious and anamalous results may depend on the age and social condition of immigrants, or the statistics of marriages and families not yet fully collected, remains for further observations. I look with great interest on the valuable collection of facts constantly growing in your company and in the records of the other Assurance Companies of America, and feel that the generous and enlightened spirit which has led to their publication will be rewareded with new discoveries in the scientific valuation of human Life. We feel, too, that from the active interest which Mr. Homans has taken in these researches, and the ability and tact with which he has conducted them, the men of science in all countries will find new light thrown upon many abstruse points, quite independent of the bearing they may have upon the interest and prosperity of the great Assurance Companies of America. Mr. Homans' Tables of Mortality have been admirably graduated, and the result is a practical Table of Value, well adapted for the calculations of an office, and, as far as I can judge, perfectly safe for its future operations.

10. *What comparative results may be expected among the present Members of the Company from the past favorable Mortality experience?*

11. *What suggestions can be made relative to the principles or practice of the Mutual Life which would tend to its security or to the advantage of its Policy holders?*"

Mr. Brown suggests, in answer to this query, that loans on the surrender value of policies have been made in Europe. (See Report on file.)

"In conclusion, I hope I may be permitted to express the pleasure we have felt in receiving the visit of your Actuary to England. Already known to us, especially in the Institute of Actuaries, by his valuable reports, and by the skill and ability he has shown in analyzing the novel facts presented by the experience of your Company; we have welcomed him as the representative of the Actuarial Science of America. We regard his visit as an honorable proof of the confidence you justly feel that the Actuaries and Managers of Assurance Companies in this country take a warm interest in the progress and success of the great Assurance Institutions in America, which, as long as they are guided by the high scientific skill and marked

by the caution, energy, and foresight which have distinguished the management of your Company, cannot fail of proving a real benefit to the members, whilst they do honor to the country in which they have made so rapid a progress.

I have the honor to be,
Gentlemen,
Your very obedient servant,
SAMUEL BROWN,
Actuary."

GUARDIAN ASSURANCE OFFICE,
11 Lombard St., London,
20th April, 1861.

REPORT OF WILL. THOS. THOMSON, ESQ.

EDINBURGH, 6th May, 1861.

To The Board of Trustees of
The Mutual Life Insurance Company, New York:

Gentlemen,—You have done me the honor to submit for my consideration and opinion certain questions relating to the principles and practice of the highly important institution under your direction. I have given these questions my best attention, and I have now the pleasure of returning answers to them, expressed in as concise a form as possible, consistently with the conveyance of my opinion in each case.

QUERY 1ST.—*Are survivorship Annuities, as a class, desirable to a life company? If not, why?*

I have no difficulty in answering this question in the affirmative. I have transacted a similar class of business in the Standard Life Assurance Company for upwards of twenty-five years, and I have found it work favorably. It does not produce a very large amount of business, and I am surprised the plan is not more frequently adopted, it being, in my opinion, a preferable mode of providing for dependants, in many cases to an ordinary assurance, for the reasons so well urged by Mr. Homans, with reference to the danger which so often results from the difficulty of finding safe investment for capital sums, which form the basis of family provisions.

QUERY 2D.—*If survivorship Annuities, as a class, are desirable, is the new table of Mortality, constructed by Mr. Homans, a safe and judicious basis, from which to deduce such rates of premium, properly loaded, for the Mutual Life Insurance Company of New York? If not, why?*

I have examined Mr. Homans' proposed Table. It has been skilfully and judiciously constructed, after careful study and consideration of the results exhibited in other well-known tables of mortality, but it is necessarily tentative in consequence of its foundation being chiefly, or I may say almost entirely, the experience of your own office, during a limited term of years. I think there are sufficient indications, however, in the results produced to afford a reasonable confidence that Mr. Homans' deductions will be borne out in your future experience, and that his table will exhibit the probable expectation of life in your most favored class. As to the applicability of the Table to survivorship annuity calculations, I would have every confidence in using it as a safe and judicious basis, but I would consider it necessary to load the resulting premiums with a percentage for the difference in value between male and female life, when the female is the nominee who is to enjoy the annuity, also a percentage by way of precaution, to regulate any unforeseen irregularity in the results of Mr. Homans' Table, until further tested by experience. With these additions, and a proper percentage for expenses, the business cannot fail to be remunerative. I am at a loss to offer any suggestions as to the comparative values of male and female life in the States, and the percentage to be added must at first be an arbitrary one; but I cannot help stating a strong impression which exists in my mind, that the same difference in favor of female life which obtains in this country will not be found to exist in the States.

QUERY 3D.—*Is the new table constructed by Mr. Homans a safe and judicious basis from which to deduce the reversionary values to be used as additions to policies in the approaching distribution of surplus? If not, why?*

The tendency of my opinion expressed in answer to the second query, leads me to the same conclusion in answering this one. Mr. Homans suggests very wisely that in computing reversionary equivalents, corresponding to present values of surplus at each age, an addition should be made to the net annual premiums. This will keep all perfectly safe, and I would have no hesitation in applying Mr. Homans table to the calculation of the reversionary additions to policies at the approaching distributions of surplus.

QUERY 4TH.—*If yes, is it advisable, in your opinion, to make the proposed modification in the scale of reversionary additions retrospective in its application to existing life policies?*

If the question were, can the Company do retrospective justice to all who have

suffered by the former mode of calculating reversionary additions, I would hesitate to say "yes" in answer to this question, as it would involve an accounting with persons interested in many closed transactions; but, as the question refers only to *existing* life policies, and Mr. Homans sees no difficulty in the practical carrying out of the accounting, I can only answer, it will be a graceful act of justice to those interested, unaccompanied by risk, based on those proper feelings which should actuate the manager of an office like the Mutual, whose duty and anxiety it evidently is to dispense equal justice to all.

QUERY 5TH.—*Is the Mathematical formula proposed by Mr. Homans* ($\frac{R=P+d}{P}$) *safe and judicious in its proposed application?*

This Mathematical formula may be depended on as being safe and judicious when applied to the calculation of the reversionary values connected with the additions to Policies.

QUERY 6TH.—*Should the dividends on Endowment Assurance Policies be ascertained and declared separately from that on ordinary life policies?*

I think Endowment Assurance Policies should be dealt with separately in the Division of profits.

An Endowment Assurance Policy consists of an assurance for a limited period, and an ordinary endowment.

The short period assurance will yield but a small share of profit, even with 25 per cent. added to the premium, and I am so much in the habit of excluding that class of business from profit schemes that I cannot bring my mind to deal with it as a class to be encouraged on the footing of participation. The Endowment, with 10 per cent. added, should yield a large profit from the difference of interest assumed and realized, as well as from the percentage added to the premiums, and it, I think, might fairly be entitled to enter into the profit class; in short, I would separate the two in this way: I would give no periodical addition to the Assurance part of the Policy, but reserve the share of profits, upon a principle to be fixed, till the Endowment becomes payable by survivance; or, if it is considered right to declare the Bonus periodically, it should not be paid in the event of death, but only in the event of survivance.

QUERY 7TH.—*In case a modification of the present or reversionary system of dividend should be thought advisable, would a* quinquennial *reduction of premium (exhausting the surplus in the five years next succeeding the declaration) be judicious and safe in its application to the Mutual Life Insurance Co. of New York? If not, why?*

I have no hesitation in recommending this application of the Dividend or Bonus. I have adopted it in the Institutions I manage, and it is fully appreciated—more so than reversionary additions, I believe, and more so than reduction of premiums for the whole term of life.

The system is judicious, and quite safe—the cash value, and its application in the manner proposed, being equivalents, the reversionary plan providing the largest benefit in that way, while the proposed application affords the greatest benefit in the way of lessening the annual payment. The only point I would throw out for consideration is, whether a small percentage should not be deducted from the Dividend or Bonus before conversion into a reduction of premium, on the ground that good lives only will select the *present* application of their share of profits.

QUERY 8TH.—*Should a Company generally pay any value on surrender of a policy on which not more than three annual premiums have been paid?*

As a matter of justice, I answer yes, undoubtedly. Why should three annual payments be considered the measure of right to a surrender value? There is a value from the beginning, and in a Mutual Office, more particularly, I consider the Policy has a claim to surrender value at any time after payment of one premium if he finds it necessary to give up his assurance. The only suggestion I would venture to make is, that a percentage be deducted for the expense of completing the transaction at first if the surrender be made at the end of the first or second years—this deduction to be in addition to the usual one made on occasion of surrender.

QUERY 9TH.—*If any corrections or alterations are necessary or expedient in the Tables mentioned in questions* (2) *and* (3), *please to state what those alterations or corrections are, and why they are necessary or expedient?*

I have no further suggestions to make. The statistical records of the Co. should be carefully kept, and the results they exhibit be compared with the Co.'s past and accruing experience from year to year, more particularly with reference to the basis of Mr. Homans' new Table.

QUERY 10TH.—*What comparative results may be expected among the present members of the "Mutual Life" from the past favorable mortality experience?*

"The favorable mortality in the past experience of the Company has proved a considerable source of profits, and has arisen either from the influence of Selection or from the use of a Table inexpressive of the true mortality in the States, or partly the one and partly the other, but the calculations of the Actuary will keep all right. All must die, but I am not of opinion that, because 20 persons have died in one year out of 1000 when 30 were expected to die, that the 980 remaining will

come under a different law of Mortality in future years than the 970 would have done."

QUERY 11TH.— *What suggestions can be made relative to the principles and practice of the Mutual Life, which would tend to its security or to the advantage of its policy holders.*

In answer to query 11th, Mr. Thomson makes two suggestions, viz., in reference to loans on policies within the surrender value; and the adoption of an extended period for the payment of premiums. (See Report on file.)

"I am much afraid that my answers to the questions you have submitted to me may appear curt and not sufficiently illustrative, but I have, at the request of Mr. Homans, avoided any lengthened argument or statement, in order that I might convey my opinion as decidedly as possible, in a few words. It will give me pleasure to enlarge on the different points submitted should it be wished, but truly your excellent Actuary requires little advice from any quarter. He is master of the subject, and he has left an impression of his talents in London, as well as in Edinburgh, which will lead his professional brothers to expect much information from him hereafter in illustration of the value of life in the wide field which his opportunities embrace. Our field in Britain is limited, and to some extent exhausted, but an interchange of ideas cannot fail to benefit both parties, and I, with many others, will look forward with pleasure to future communication and correspondence with Mr. Homans. I have been much impressed with the rapid progress and sound position of the Mutual. I had heard of its prosperity, from time to time, for some years, but it was not until I had the pleasure of meeting Mr. Homans on this occasion that I fully appreciated the importance of the Institution.

I have the honor to be, with much respect,

Yonr most obed't servant,

(Signed) WILL. T. THOMSON,

Actuary."

TABLE No. 1.

Annual Premiums necessary to secure a Survivorship Annuity of $100, on the Life of a Person now aged (Y), commencing at the Death of a Person now aged (X).

AGE OF (Y.)	X = 60	X = 55	X = 50	X = 45	X = 40	X = 35	X = 30	X = 25	X = 20
60	$44.76	$30.46	$20.95	$16.54	$14.52	$12.17	$10.62	$9.05	$7.70
55	54.32	37.42	26.00	20.26	17.40	14.51	12.65	10.75	9.17
50	64.84	45.27	31.76	24.56	20.75	17.15	14.89	12.60	10.75
45	75.50	53.41	37.90	29.21	24.37	20.02	17.20	14.55	12.37
40	85.33	61.10	43.93	33.95	28.09	22.95	19.57	16.47	14.06
35	94.24	68.29	49.65	38.61	31.84	25.95	21.99	18.46	15.69
30	102.24	74.89	55.06	43.06	35.57	29.00	24.45	20.47	17.34
25	109.40	80.79	60.00	47.25	39.10	31.96	26.94	22.50	19.03
20	116.00	86.23	64.54	51.12	42.50	34.84	29.39	24.56	20.71

TABLE No. 2.

Annual Premiums necessary to secure a Survivorship Annuity of $100, on the Life of a Person now aged (Y), commencing at the Death of a Person now aged (X)—with return of all Premiums Paid, in case (Y) should predecease (X).

AGE OF (Y.)	X = 60	X = 55	X = 50	X = 45	X = 40	X = 35	X = 30	X = 25	X = 20
60	$71.09	$53.70	$40.85	$35.21	$33.10	$28.96	$26.14	$22.80	$19.85
55	77.29	58.00	43.94	37.34	34.27	30.17	27.31	23.75	20.64
50	83.95	62.46	47.53	39.74	35.90	31.31	28.36	24.69	21.60
45	90.68	68.09	51.54	42.35	37.77	32.64	29.36	25.76	22.51
40	98.29	73.62	55.59	45.26	39.60	34.19	30.54	26.61	23.44
35	106.30	79.33	59.83	48.51	41.85	35.80	31.79	27.50	24.18
30	113.26	84.87	64.14	51.80	44.34	37.51	33.00	28.45	24.96
25	119.68	89.89	68.20	55.10	46.89	39.49	34.47	29.70	25.86
20	125.25	93.56	72.08	58.21	49.46	41.54	35.96	30.84	26.71

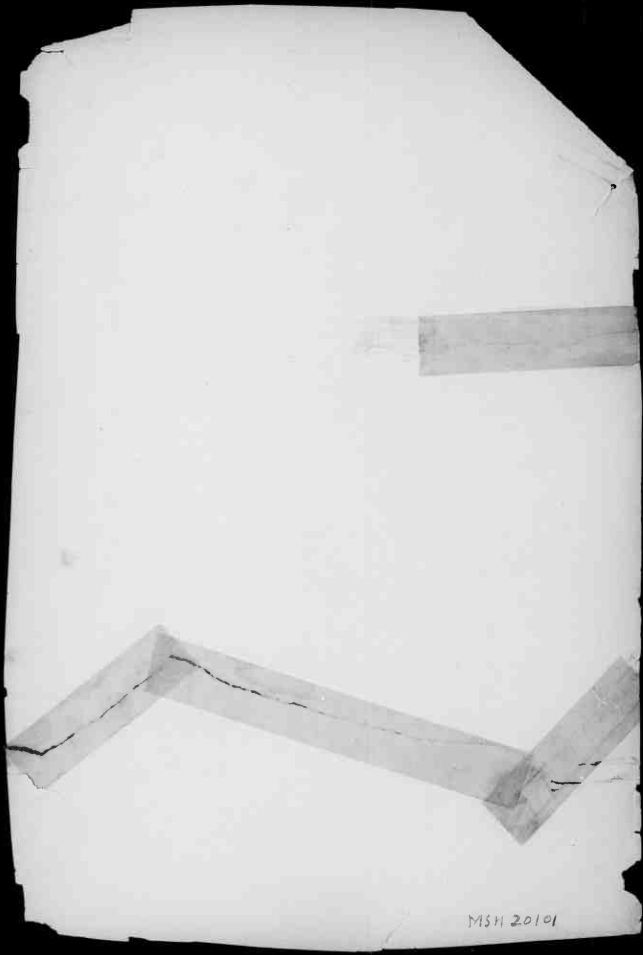
TABLE No. 3.

AGE.	NET ANNUAL PREMIUM ON $10,000.				ANNUAL PREMIUM CHARGED BY COMPANY.	ACTUAL LOADING PER CENT.			
	Co's. TABLE C. GILL.	Co's. GEN. EXPERIENCE	HOMANS' NEW TABLE.	ACTUARIES' TABLE.		COMPANY'S TABLE.	COMPANY'S EXPERIENCE.	HOMANS'.	ACTUARIES'.
10	$105.80	$104.16	$105.25	$104.29	$132.24	25	27	25	27
15	120.84	113.39	114.68	115.44	151.05	25	33	32	31
20	138.37	124.89	126.68	129.50	172.96	25	38	36	34
25	159.13	139.31	142.10	147.22	198.91	25	43	40	35
30	184.18	157.65	162.11	169.71	230.23	25	46	42	36
35	214.99	181.54	188.42	198.68	268.73	25	48	43	35
40	253.83	213.85	223.54	236.77	317.29	25	48	42	34
45	304.81	259.87	271.23	288.47	380.38	25	46	40	32
50	371.34	322.29	336.97	357.78	464.17	25	44	38	30
55	460.62	407.79	427.92	450.25	575.77	25	41	35	28
60	582.74	532.18	554.53	575.54	728.43	25	37	31	27
65	750.92	710.90	740.98	747.25	938.65	25	32	27	26
70	982.01	968.01	983.98	982.07	1227.51	25	27	25	25

TABLE No. 4.

Reversionary Values at Different Ages of $100.

AGE.	MUTUAL LIFE INSURANCE COMPANY OF NEW-YORK.					HOMANS' NEW TABLE.	
	GENERAL EXPERIENCE	NET VALUE. OFFICE TABLE.	SINGLE PREMIUM CHARGED BY THE COMPANY.	DIVIDEND 1853.	DIVIDEND 1858.	NET VALUE.	VALUE PROPOSED FOR DIVIDEND.
10	.....	$463.55	$425.63	.....	.....	$465.42	$417.80
15	$439.18	418.28	385.08	$300.30	$300.30	435.40	391.65
20	407.97	377.96	348.97	282.87	286.54	403.61	364.01
25	376.08	341.70	316.49	265.25	268.69	370.66	335.36
30	343.96	308.82	287.04	247.84	248 97	337.26	306.31
35	311.85	278.90	260.24	230.95	229.06	304.12	277.50
40	279.85	251.53	235.72	214.68	210.07	272.06	249.61
45	248.00	226.39	213.21	199.20	192.61	241.81	223.31
50	219.34	203.58	192.77	184.47	176.95	214.14	199.25
55	194.32	183.50	174.79	170.65	163.13	189.88	178.16
60	172.27	166.00	159.12	157.77	151.08	169.36	160.31
65	154.10	151.22	145.88	145.88	140.65	152.50	145.14
70	139.73	139.17	135.08	135.08	131.69	139.08	133.66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